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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,782	11/26/2003	Hangching Grant Wang	03-0459 (BOE 0456 PA)	9058
7590	12/21/2005		EXAMINER HOLZEN, STEPHEN A	
Jeffrey J. Chapp Suite 250 28333 Telegraph Road Southfield, MI 48034			ART UNIT 3644	
DATE MAILED: 12/21/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/723,782		WANG ET AL.	
	Examiner		Art Unit	
	Stephen A. Holzen		3644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 8, 14-22, 26, 27 and 31-40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-13, 23-25 and 28-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of claims 1-7,9-13,23-25,28-30 in the reply filed on 9/12/2005 is acknowledged.
2. The examiner has made the determination, which claims read on the elected species. The applicant has still failed to specifically point out which claims read on and are generic to the elected species. The applicant should note that the examiner was requesting a listing of claims that read on and are generic to the elected invention.
3. Here is a sample response that most applicants use to respond to elections and restrictions.

"Applicant hereby elects groups I, a, d, k, l, p, s. Claims 1-7, 9-13, 23-24,28-30 are generic to the elected invention. This election is made without traverse."

Applicant should understand that a statement such as "claims 1-13 and 23-34 are readable on group 1" also means --claims 14-22 do not read on the elected invention--. Using similar logic the phrase "claim 13 is readable on group k" implies that every claim but claim 13 does not read on group k, (and therefore all claims but claim 13 are withdrawn from consideration).

A statement such as "Claim 13 is readable on group k" is not appropriate since (1) claims 1, 13 and 23 are each generic to group k.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

5. Claims 1-7, 9-13, 23-25, 28-30 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re – Claims 1 and 2: The "in response to a yaw attitude residual" clause provides language that suggests or makes optional but does not require steps to be performed or does not limit the scope of a claim or claim limitation (MPEP § 2106(II,C)). Accordingly, the metes and bound of the claim cannot be ascertained by one having ordinary skill in the art.

Is the phrase "in response to a yaw attitude residual" a separate and distinct step? If so, is claim 2 further defining this step or introducing a new step?

Regarding the remaining claims: Some of the claims use the language "in response to". The examiner is not clear as to what this language means. Is the applicant claiming a method step limitation? Or is the applicant implying that these limitations have taken place in the past? See claim 3, for example, where the applicant

claims "in response to a thermal mode estimation". The examiner cannot determine if the thermal estimation step is claimed.

Furthermore what all is meant and encompassed by "in response to". How is the yaw attitude residual being determined? How is the thermal model being estimated? The examiner believes that the phrases following the "in response to" clauses are separate method steps (claim elements) although believes that one of ordinary skill in the art would not be capable of understanding how to find/estimate/determine the yaw attitude residuals without undue experimentations.

In order to clarify the claim language the applicant should consider replacing the phrase "in response to" with a phrase such as "... determining a yaw attitude residual, then determining a roll gyro bias residual...."

DETAILED ACTION

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) The invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 2, 6, 7, 9 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Patouraux (6,804,986). Patouraux discloses a method for controlling satellites, especially geostationary satellites. Patouraux does not provide a sensor for measuring the yaw angle and discloses that the yaw angle is usually estimated and

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controlled by means of the roll/yaw coupling that occurs throughout the orbit when an angular momentum bias is present on the spacecraft. (See Col. 1, lines 19-24).

Patouraux's method is based on direct measurement of the yaw angle purely based on the geometry of the sensor (the method does not require long data collection period but only needs two measurements on two sensors to infer a yaw angle). The first yaw determination is made on the reference orbit and the second is made on the second orbit. (See col. 10, lines 8-15). The final orientation depends on the order of rotation: if the yaw/pitch/roll orders of rotation is picked then the final attitude is reached by first rotating the frame around the yaw axis, then rotating around the new pitch axis and then around the new roll axis. (See Col. 4, lines 15-20). The roll and pitch errors of at least one of the sensor are sent to the on-board processor for roll and pitch control (see Col. 4, lines 55-60). When a yaw error exists (as illustrated in Figure 4) the direction in which roll and pitch errors are measure would be canted by γ . (See Col. 5, lines 7-8).

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) The invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1-7, 9-13, 23-25, 28-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Horton (6,853,947). Horton discloses a method that sense the attitude of a satellite by measuring acceleration with accelerometers and gyroscopes, then

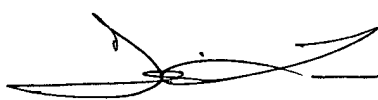
determines corrective rate signals to reduce residual drift. Horton teaches that it is known to use different methods for generating corrective rate signals such as with a Kalman Filter or with fixed gains scheduling. Figure 3 illustrates that a corrective rate for the yaw axis acceleration may be generated based upon the measurements of the sensors 18a-18c. Horton further discloses that temperature corrections can be digitally incorporated into the data output (see Col. 6, lines 28-31). Figure 6 illustrates a step of obtaining and setting the correction factors and is designed to adaptively estimate the correction factors of sensors and their measurements. Horton discloses a state model that predicts where the attitude errors and rate sensor bias states will propagate based on input data from the rate sensors and the measurement model corrects this prediction with real attitude error measurements obtained from the sensors and uses the Kalman filter to correct the trajectory calculated by the processor #61 (see Col. 13, lines 37-44).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen A. Holzen whose telephone number is 571-272-6903. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Teri Luu can be reached on 571-272-7045. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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